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| EXAMINER | |
|---|---|
| ANGELL, JON E | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 1635 | |

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14

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/685,343 | CHARNEAU ET AL. | |
| | Examiner | Art Unit | |
| | J. Eric Angell | 1635 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on _____ .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1,8-32 and 41-43* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,8-32 and 41-43* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

## DETAILED ACTION

Claims 2-7 and 33-40 have been cancelled, as requested in Paper No. 13.

Claims 1, 8-32 and 41-43 are pending in the application.

### *Claim Rejections - 35 USC § 112*

*1.* The previous rejection of claims 10, 21-28, 33-40 under 35 U.S.C. 112, first paragraph are withdrawn. Applicants have either amended the claims to only encompass transfer of the nucleic acid to cells in vitro, or cancelled the claims (i.e. claims 33-40 are cancelled

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 41 and 43 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Akkina et al (Journal of Virology (1996) 70:2581-2585)

Akkina et al disclose a recombinant HIV-1 vector which meet the limitations of claims 1-4, 6-9, 11, 12, 14-25, 28-31, 41 and 43.

Claims 1-4, 6 and 7 are drawn to an isolated nucleic acid comprising the cPPT and CTS regions of HIV-1 . Claim 8 is drawn to said nucleic acid also comprising a heterologous sequence. Claim 9 specifies that the heterologous nucleic acid is a peptide, polypeptide or a protein. Akkina et al disclose an HIV-1 based vector comprising the entire HIV-1 genome except

for a deletion within the ENV gene. The vector also comprises the firefly luciferase gene(see page 2582, figure 1) Since the construct contains both the cPPT/ CTS regions (the vector contains the entire coding sequence of the pol gene as well as sequences 3' to the pol gene) and a heterologous sequence encoding a protein the limitations of Claims 1-4 and 6-8 are clearly anticipated. It should be further noted that the breadth of claims 1-4 and 6-8 encompass wild type HIV-1 and these claims are also anticipated by any disclosure of a complete HIV-1 nucleic acid

The vector disclosed in Akkina et al is an expression vector, coding for both HIV-1 proteins and firefly luciferase. The vector is described as being transfected into COS cells. Retroviral particles comprising the vector are used to infect several cell types including hematopoeitic progenitor cells (stem cells) (see page 2582 1st column and Table 1). Hence, the limitations of Claims 11,12, 14 and 18-20 are clearly anticipated.

Claim 15, 16 and 17 recite a virus, wherein the virus is a retrovirus or a lentivirus. The viral vector described in Akkina is a virus. The vector is derived from a lentivirus which is also a retrovirus. Hence claims 15-17 are clearly anticipated.

Claims 21 and 22 are drawn to a process for the insertion of a nucleic acid of interest into the nucleus of a cell wherein the nucleic acid comprises at least one copy of the HIV-1 cPPT and CTS regions. Claim 23 recites the nucleic acid is a vector. Claims 24 and 25 recite that the nucleic acid comprises a heterologous nucleic acid and that the heterologous nucleic acid encodes a peptide polypeptide or protein. Claims 29 –31 are drawn to a process for expressing a gene of interest in vitro utilizing a nucleic acid comprising the cPPT and CTS regions. The nucleic acids encompassed by the processes of claims 21-25 and 29-31 are anticipated by vector

of Akkina et al (as set forth in the rejections for claims 11,12,14 and 18 above.) Akkina et al use the vector for the expression of viral and marker (luc) genes in several cell types, hence the process of in vitro expression of a gene of interest is clearly anticipated. Claims 21-25 and 29 – 31 are also anticipated by the expression of proteins by wild type HIV-1.

Claims 41 and 43 are drawn to a nucleic acid comprising the cPPT/CTS region of HIV-1. Claim 43 specifies that the nucleic acid is a vector. The critical limitations of these claims are also clearly anticipated by the HIV-1 vector disclosed by Akkina et al on page 2582 of their disclosure.

***Response to Arguments***

2. The rejections of claims 41 and 43 are maintained because Applicant did not respond to the rejections. The rejections have not been rebutted and the claims have not been amended or cancelled, therefore, the rejections of claims 41-43 are maintained.

It is noted that Applicant states in Paper No. 13 "Claim 41 and 43 was also rejected under 35 U.S.C. § 102(b). These claims have been canceled, thus obviating a response to this rejection." (see page 7, first paragraph) and "Claim 42 was also rejected under 35 U.S.C. § 103(a). Claim 42 has been canceled, thus obviating a response to this rejection." (see page 8, last paragraph). However, it is respectfully noted that Applicant has not requested the cancellation of claims 41-43, therefore they have not been officially cancelled. Only claims 2-7 and 33-40 have been cancelled, as requested in Paper No. 13.

3. The rejection of claims 1-4, 6-9, 11, 12, 14-25, 28-31under 35 U.S.C 102 have been withdrawn in light of the amendments.

***Claim Rejections - 35 USC § 103***

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Akkina et al (Journal of Virology (1996) 70:2581-2585).

Claims 10 and 24-26, are drawn to nucleic acid constructs encoding heterologous nucleic acids, wherein the scope of the heterologous nucleic acid encompasses sequences encoding therapeutic proteins. Claim 27 is drawn to a process for inserting a nucleic acid into a target cell wherein the target cell is a non-dividing cell. Claim 32 is drawn to the purification or isolation of the proteins encoded by the heterologous sequence and claim 42 is drawn to a kit comprising a nucleic acid encoding the therapeutic protein.

The term "therapeutic protein" is broadly drawn and encompasses the proteins encoded by HIV-1. Therefore, the vector disclosed by Akkina et al encompass claims to a nucleic acid comprising therapeutic proteins and anticipates the limitations of claims 10, 24-26 and 42. An inherent property of lentiviral based vectors is the ability to infect non-dividing cells. A principal art utilized advantage of lentiviral vectors is there ability to infect non-dividing cells. Hence, the limitation of claim 27 is met by the disclosure of Akkina et al. In addition the vector disclosed by Akkina et al can be used for the isolation and purification of said therapeutic proteins by cell transfection and protein purification techniques widely known in the art. Any of the protein encoded for in the Akkina vector are of significant interest in the art of virology. Hence, the use of the vector for the production of these proteins would be obvious for one skilled in the art. In

addition, the replacement of luciferase protein by any other protein for expression and/or purification is an obvious aspect of the vector taught by Akkina and it would be apparent to one of skill in the art to utilize the vector in such a way.

The term "therapeutic protein" is broadly drawn and encompasses the proteins encoded by HIV-1. Therefore, the vector disclosed by Akkina et al encompass claims to a nucleic acid comprising therapeutic proteins and anticipates the limitations of claim 42.

***Response to Arguments***

5. The rejections of claims 41-43 are maintained because Applicant did not respond to the rejections. The rejections have not been rebutted and the claims have not been amended or cancelled, therefore, the rejections of claims 41-43 are maintained.

It is noted that Applicant states in Paper No. 13 "Claim 41 and 43 was also rejected under 35 U.S.C. § 102(b). These claims have been canceled, thus obviating a response to this rejection." (see page 7, first paragraph) and "Claim 42 was also rejected under 35 U.S.C. § 103(a). Claim 42 has been canceled, thus obviating a response to this rejection." (see page 8, last paragraph). However, it is respectfully noted that Applicant has not requested the cancellation of claims 41-43, therefore they have not been officially cancelled. Only claims 2-7 and 33-40 have been cancelled, as requested in Paper No. 13.

6. The rejection of claims 10, 24-26, 32 under 35 U.S.C. 103 are withdrawn in light of the amendment.

***New Rejections***

***Claim Rejections - 35 USC § 112, second paragraph***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1 and 8-32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The instant claims now encompass an isolated or purified nucleic acid consisting of the sequence depicted in Figure 5A. However, Figure 5A is only a schematic diagram of a viral genome (as ascertained from the description of Figure 5A, page 8, lines 1-7), and there is no disclosure of the specific nucleotide sequence of Figure 5A in the figures or in the specification. Therefore, the exact sequence of the claimed nucleic acid cannot be determined, rendering the claims indefinite. Additionally, Figure 5A comprises a region labeled "CMV". "CMV" can be construed to mean either cytomegalovirus or cucumber mosaic virus, as both viruses are commonly referred to as "CMV". Furthermore, the sequence that comprises the depicted "CMV" region is not clear. For instance, the region could be the entire genome of "CMV", a specific region of "CMV" or a functionally equivalent variant of "CMV". Similarly, the sequence of the regions identified as "EGFP" and "cPPT CTS" are also unclear. Therefore, without a specific disclosure of the nucleotide sequence depicted in Figure 5A, the sequence of the claimed nucleic acid is unclear and the instant claims are indefinite.

***Claim Rejections - 35 USC § 112, first paragraph***

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1 and 8-32 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

As mentioned above, the instant claims encompass an isolated or purified nucleic acid consisting of the sequence depicted in Figure 5A. However, Figure 5A is only a schematic diagram of a viral genome (as ascertained from the description of Figure 5A, page 8, lines 1-7), and there is no disclosure of specific nucleotide sequence of Figure 5A in the figures or the specification. Without an explicit disclosure of the sequence of the nucleic acid of Figure 5A, the claimed nucleic acid can comprise any sequence. Additionally, the regions labeled "CMV" in Figure 5A could be sequences of cytomegalovirus or cucumber mosaic virus or of variants of these virus sequences, a genus comprising millions of possible sequences considering every possible sequence that could be present in the nucleic acid sequence of Figure 5A.

The written description guidelines note regarding such genus/species situations that "Satisfactory disclosure of a 'representative number' depends on whether one of skill in the art would recognize that the applicant was in possession of the necessary common attributes or features of the elements possessed by the members of the genus in view of the species

disclosed." (See: Federal Register: December 21, 1999 (Volume 64, Number 244), revised guidelines for written description.) Here, no common element or attributes of the sequences are disclosed. No structural or functional limitations or requirements which provide guidance on the identification of the sequences is provided.

It is noted in the recently decided case The Regents of the University of California v. Eli Lilly and Co. 43 USPQ2d 1398 (Fed. Cir. 1997) decision by the CAFC that:

> "In claims to genetic material, however, a generic statement such as "vertebrate insulin cDNA" or "mammalian insulin cDNA," without more, is not an adequate written description of the genus because it does not distinguish the claimed genus from others, except by function. It does not specifically define any of the genes that fall within its definition. It does not define any structural features commonly possessed by members of the genus that distinguish them from others. One skilled in the art therefore cannot, as one can do with a fully described genus, visualize or recognize the identity of the members of the genus. A definition by function, as we have previously indicated, does not suffice to define the genus because it is only an indication of what the gene does, rather than what it is. See Fiers, 984 F.2d at 1169- 71, 25 USPQ2d at 1605- 06 (discussing Amgen). It is only a definition of a useful result rather than a definition of what achieves that result. Many such genes may achieve that result. The description requirement of the patent statute requires a description of an invention, not an indication of a result that one might achieve if one made that invention. See In re Wilder, 736 F.2d 1516, 1521, 222 USPQ 369, 372- 73 (Fed. Cir. 1984) (affirming rejection because the specification does "little more than outlin[e] goals appellants hope the claimed invention achieves and the problems the invention will hopefully ameliorate."). Accordingly, naming a type of material generally known to exist, in the absence of knowledge as to what that material consists of, is not a description of that material."

It is noted that in Fiers v. Sugano (25 USPQ2d, 1601), the Fed. Cir. concluded that:

> "...if inventor is unable to envision detailed chemical structure of DNA sequence coding for specific protein, as well as method of obtaining it, then conception is not achieved until reduction to practice has occurred, that is, until after gene has been

In the instant application, no specific sequence of the nucleic acid of Figure 5A is described.

Also, in Vas-Cath Inc. v. Mahurkar (19 USPQ2d 1111, CAFC 1991), it was concluded that:

> "...applicant must also convey, with reasonable clarity to those skilled in art, that applicant, as of filing date sought, was in possession of invention, with invention being, for purposes of "written description" inquiry, whatever is presently claimed."

In the application at the time of filing, there is no description of the nucleic acid sequence depicted in Figure 5A. Therefore, the claims fail to meet the written description requirement by encompassing sequences which are not described in the specification.

***Conclusion***

No claims are allowed.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to J. Eric Angell whose telephone number is (703) 605-1165. The examiner can normally be reached on M-F (8:00-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John L. LeGuyader can be reached on (703) 308-0447. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-4242 for regular communications and (703) 308-4242 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.

J. Eric Angell
July 15, 2002

JEFFREY FREDMAN
PRIMARY EXAMINER